

**CLAIMS:**

1. An apparatus for downhole production or injection wells, comprising:  
2      a) one or more downhole production or injection wells; and  
3      b) a control system comprising:  
4           i) one or more surface control and data acquisition systems;  
5           ii) one or more sensors disposed in communication with the surface  
6 control and data acquisition systems;  
7           iii) one or more downhole devices disposed in communication with the  
8 surface control and data acquisition systems; and  
9           iv) one or more remote controllers disposed in communication with the  
10 surface control and data acquisition systems.
1. 2. The apparatus of claim 1 wherein the downhole devices comprise one or more  
2 devices selected from the group of smart shunt screens, sliding sleeves, chemical injection  
3 devices, circulating valves, gas lift valves, water injection valves, smart screens chokes,  
4 diverters, flappers, safety valves, and packers.
1. 3. The apparatus of claim 1 wherein the downhole devices are disposed in  
2 communication with one or more components of the one or more downhole production or  
3 injection wells.
1. 4. The apparatus of claim 1 wherein the downhole devices are disposed in  
2 communication with one or more sensors of the control system.
1. 5. The apparatus of claim 1 wherein the one or more sensors comprise one or more  
2 permanent downhole sensors.
1. 6. The apparatus of claim 1 wherein the one or more sensors comprise one or more  
2 retrievable sensors.
1. 7. The apparatus of claim 1 wherein the control system comprises an electric control

2 system.

1 8. The apparatus of claim 1 wherein the downhole production well comprises an  
2 artificial lift system disposed in cooperation with the downhole well.

1 9. The apparatus of claim 8 wherein the artificial lift system includes a programmable  
2 automation control system.

1 10. The apparatus of claim 8 wherein the artificial lift system includes one or more  
2 surface sensors disposed to monitor operation of the artificial lift system.

1 11. The apparatus of claim 8 wherein the artificial lift system includes one or more  
2 sub-surface sensors disposed to monitor operation of the artificial lift system.

1 12. The apparatus of claim 8 wherein the control system comprises an electric control  
2 system.

1 13. The apparatus of claim 1, further comprising:  
2 c) a retrievable pump system disposed in cooperation with the downhole  
3 production or injection well.

1 14. The apparatus of claim 13 wherein the retrievable pump system comprises sensors.  
*See 6089,832*

1 15. The apparatus of claim 13 wherein the retrievable pump system is deployed by a  
2 component selected from the group consisting of coil tubing, electric line, hydraulic  
3 pumping, and wire line.

1 16. The apparatus of claim 15 wherein the retrievable pump system is connected to one  
2 or more communication control member selected from the group of fiber optic lines, fluid  
3 pumping lines, electric lines and wireless components.

1 17. The apparatus of claim 13 wherein the retrievable pump system comprises one or

2 more pumps selected from the group consisting of an electric submersible pump, a linear  
3 motor drive pump, an impeller driven pump, a progressive cavity pump, a gas lift, a rod  
4 pump and a jet pump.

1 18. The apparatus of claim 17 wherein the electric submersible pump is disposed in  
2 electrical connection with one or more wet connects disposed inside a production tubing of  
3 the downhole production well.

1 19. The apparatus of claim 17 wherein the electric submersible pump is disposed in  
2 electrical connection with an inductive coupler connected to the control system.

20. The apparatus of claim 1 wherein the control system further comprises:

v) a communication device disposed between the one or more remote  
3 controllers and the one or more surface control and data acquisition systems.

1 21. The apparatus of claim 20 wherein the communication device comprises one or  
2 more devices selected from the group of a telephone system, a satellite system, an internet  
3 system, and a radio system.

1 22. The apparatus of claim 21 wherein the remote controller comprises a computer  
2 having an internet access and wherein the communication device comprises an internet  
3 web site server.

1 23. The apparatus of claim 22 wherein the control system further comprises:

vi) a satellite system adapted to link signals between the internet web  
3 site server and the surface control and data acquisition system.

1 24. An apparatus for downhole production or injection, comprising:

2 a) one or more completed electrically controlled wells;  
3 b) one or more artificial lift systems incorporated in the one or more  
4 completed wells; and

5 c) a control system comprising:

6                   i)       one or more surface control and data acquisition systems;  
7                   ii)      one or more formation sensors disposed in communication with the  
8       surface control and data acquisition systems;  
9                   iii)     one or more devices of the artificial lift system disposed in  
10      communication with the surface control and data acquisition systems; and  
11                  iv)      one or more remote controllers disposed in communication with the  
12       surface control and data acquisition system.

1   25.   The apparatus of claim 24 wherein the one or more artificial lift systems comprises  
2       one or more surface sensors and one or more sub-surface sensors.

1   26.   The apparatus of claim 24 wherein the one or more artificial lift systems comprise  
2       one or more programmable automation control systems.

1   27.   The apparatus of claim 24, further comprising:  
2           c)      a retrievable pump system disposed in cooperation with the electrically  
3       controlled well.

1   28.   The apparatus of claim 27 wherein the retrievable pump system is deployed by a  
2       component selected from the group consisting of coil tubing, electric wire line, hydraulic  
3       pumping, and wire line.

1   29.   The apparatus of claim 28 wherein the retrievable pump system is connected to one  
2       or more control lines selected from the group consisting of fiber optic lines, fluid pumping  
3       lines, and electric lines.

1   30.   The apparatus of claim 27 wherein the retrievable pump system comprises one or  
2       more pumps selected from the group consisting of an electric submersible pump, a linear  
3       motor drive pump, an impeller driven pump, a progressive cavity pump, a gas lift, a rod  
4       pump and a jet pump.

1   31.   The apparatus of claim 30 wherein the retrievable pump system is disposed in

2 electrical connection with one or more wet connects disposed inside a production tubing of  
3 the downhole production well.

*Sub*  
*A2*  
1 32. The apparatus of claim 24, further comprising:

2 d) a communication device disposed between the one or more remote  
3 controllers and the one or more surface control and data acquisition systems, wherein the  
4 communication device comprises one or more devices selected from the group of a  
5 telephone system, a satellite system, an internet system, and a radio system.

1 33. The apparatus of claim 32 wherein the remote controller comprises a computer  
2 having an internet access and wherein the communication device comprises an internet  
3 web site server.

1 34. The apparatus of claim 33 further comprising:

2 e) a satellite system adapted to link signals between the internet web site  
3 server and the one or more surface control and data acquisition systems.

1 35. An apparatus for controlling and monitoring one or more production or injection  
2 wells, comprising:

3 a) one or more surface control and data acquisition systems;  
4 b) one or more sensors disposed in communication with the one or more  
5 control and data acquisition systems;  
6 c) one or more downhole devices disposed in communication with the one or  
7 more control and data acquisition systems; and  
8 d) one or more remote controllers disposed in communication with the one or  
9 more surface control and data acquisition systems.

1 36. The apparatus of claim 35 further comprising:

2 e) a communication device disposed between the one or more remote  
3 controllers and the one or more surface control and data acquisition systems.

1 37. The apparatus of claim 35 wherein the communication device comprises one or

2 more devices selected from the group of a telephone system, a satellite system, an internet  
3 system, and a radio system.

1 38. The apparatus of claim 37 wherein the remote controller comprises a computer  
2 having an internet access and wherein the communication device comprises an internet  
3 web site server.

23 1 39. The apparatus of claim 38 further comprising:  
2 f) a satellite system adapted to link signals between the internet web site  
3 server and the one or more surface control and data acquisition systems.

1 40. The apparatus of claim 35 wherein the sensors comprise one or more permanent  
2 downhole sensors.

1 41. The apparatus of claim 35 wherein the sensors comprise one or more retrievable  
2 downhole sensors.

1 42. A method for monitoring and controlling a production or injection well or oilfield,  
2 comprising:

3 a) transmitting data collected by a downhole sensor module to a control and  
4 data acquisition system;

5 b) evaluating downhole operating conditions and optimizing downhole  
6 operating parameters utilizing an optimization software program disposed in  
7 communication with the control and data acquisition system; and

8 c) transmitting signals between the control and data acquisition system and a  
9 remote controller utilizing a communication system, the remote controller comprising a  
10 computer having an internet access.

43. The method of claim 42, further comprising:

d) storing data collected by the downhole sensor module in a memory storage  
in the control and data acquisition system.

1 44. The method of claim 42, further comprising:  
3      d) collecting operational data utilizing one or more surface sensors connected  
to the control and data acquisition system.

1      Sub  
2      P-1  
3 45. The method of claim 42 wherein the control and data acquisition system utilizes a  
satellite link to transfer data via satellite to the remote controller.

1      Sub  
2      P-2  
3 46. The method of claim 42 wherein the remote controller sends commands to the  
control and data acquisition system to modify operation of a downhole pump or to change  
parameters inside the control and data acquisition system.

1 47. The method of claim 42 wherein the control and data acquisition system provides  
2 on-site access to data and control of operation parameters.

1 48. The method of claim 42 wherein one or more control modules are disposed inside  
2 the wellbore to control the flow of fluids in the wellbore to optimize downhole component  
3 efficiency.

1 49. The method of claim 42 wherein the downhole sensors are connected to the control  
2 and data acquisition system through a hydraulic line or an electric line deployed from the  
3 surface into the wellbore.

1      Sub  
2 50. The method of claim 42 wherein the remote controller is adapted to send a  
command to the downhole sensor module via satellite communications.

1 51. The method of claim 42 wherein the downhole sensor module is connected to the  
2 control and data acquisition system utilizing digital or analog communication techniques.

1 52. The method of claim 42 wherein the downhole sensor module is connected to the  
2 control and data acquisition system utilizing one or more communication members  
3 selected from the group of electrical cables, fiber optic cables, hydraulic devices,  
4 electromagnetic devices, earth conduction devices, and acoustic devices.

1    53.    The method of claim 42 wherein the control and data acquisition system is adapted  
2    to control amount of chemicals delivered inside the wellbore.

1    54.    The method of claim 42 wherein the control and data acquisition system is adapted  
2    to monitor and control steam injection into the wellbore.

1    55.    The method of claim 42 wherein the control and data acquisition system is adapted  
2    to monitor and control formation influx.

1    56.    The method of claim 42 wherein the control and data acquisition system is adapted  
2    to monitor and control water influx.

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